HDL®

User Manual

Logic timer module

SB-DN-Logic960

buspro

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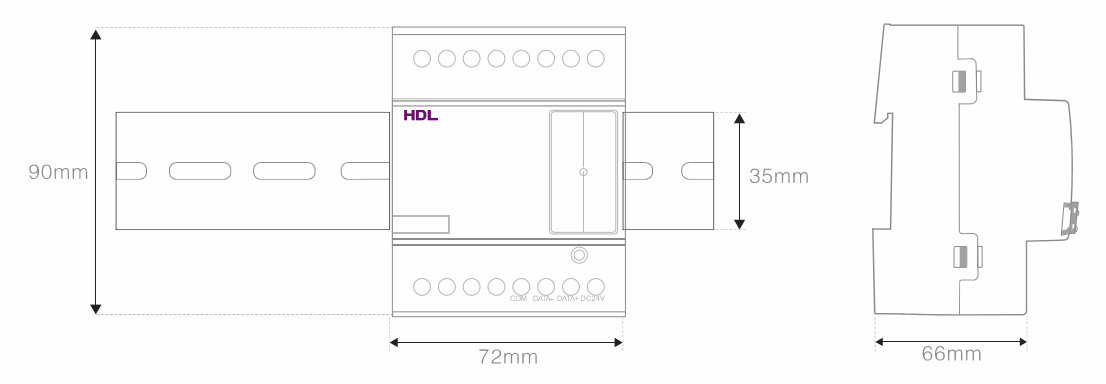
1. Overview

1.1 General Information

1.1.1 Description

SB-DN-Logic960 is an intelligent programmable logic controller which is developed by HDL, it can control the system automatically by logic lines such as: - scene, channel status, input status, date, time and so on. You can use AND, OR, NAD and NOR logic blocks to build up different logics for different applications, moreover, it has real-time clock so you can build up schedules too.

1.1.2 Mounting

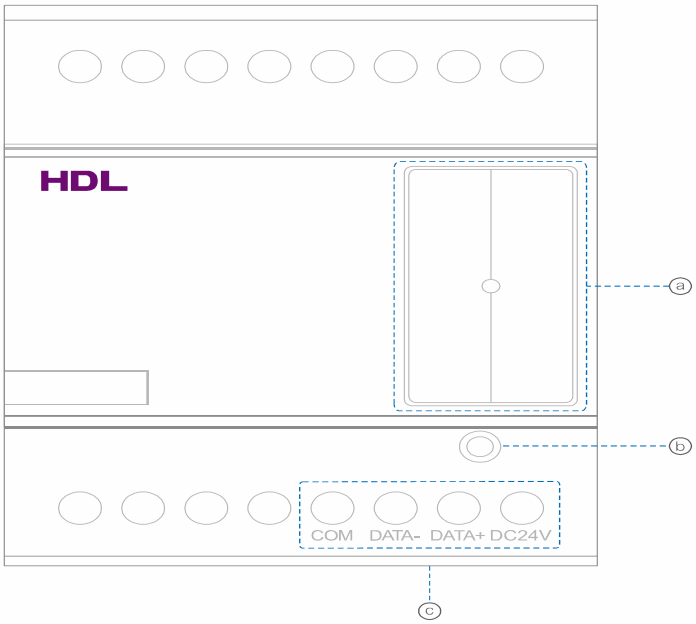


- Standard 35mm Din Rail Installation
- Inside Distribution Box(DB)

1.2 functionalities

- Supports 12 logic groups and each group have 20 logic tables.
- Each logic table can set 4 logic input condition and 20 input targets.
- Logical table input condition: Time, Date, Year, Week, Scene working status, external device input status, Wall panel status, and security setting.
- Logic relation: AND, OR, XOR, NAND
-

1.3 Device Description



a. LED indicator
b. programming button
c. HDL-bus pro

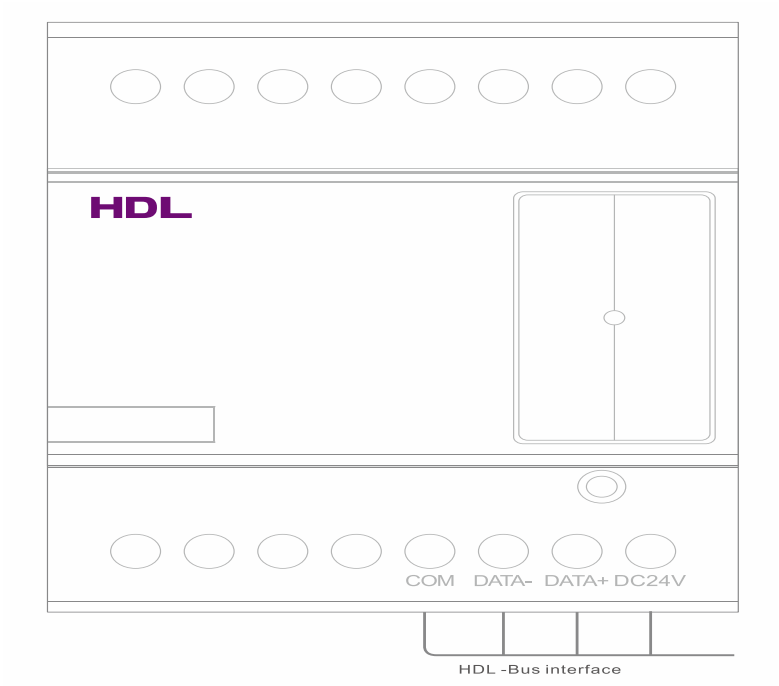
2. Technical Data

Electric Parameter ：	
Bus power	DC12~30V
Bus power consumption	15mA/DC24V
Environmental Condition：	
Working temperature	-5℃~45℃
Working relative humidity	Up to 92%
Storage temperature	-40℃~+60℃
Storage relative humidity	10%~93%
Approved	
CE	
RoHS	
Production information：	
Dimensions	72×88×66 (mm)
Installation	35mm Din Rail installation
Protection degree	IP20

3. Installation

3.1 Wiring

Please follow the wiring showed below strictly.



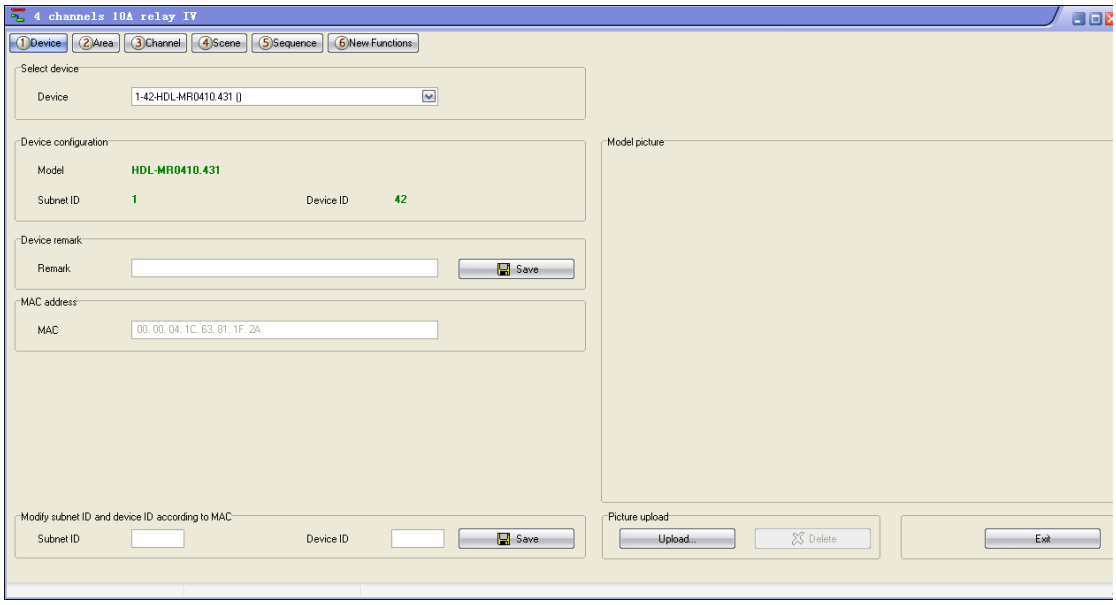
4.2 HDL BUS Pro Description

Connector Information

buspro	
DC24V	Red
COM	Black
DATA-	White
DATA+	Yellow

4. Software Configurations

4.1 Basic setting



4.1.1 Change the ID of the device

Each HDL-device has subnet and Device ID and each module's Device ID must be unique and different from other devices on the same Bus, the subnet ID should be the same as the HDL-Bus gateway (typically the SB-DN-1IP or HDL-MBUS01IP.431).

Method One:

1. Run the HDL-BUS Pro Setup tool.
2. Long press the "programming button" and keep pressing it for 3 seconds until it turns to a red color.
3. On the software, click ton "Address management", and select "Modify address (when device button is pressed)" option, it will show a window like below:

4. click on "Indicate initial address", then it will show the current subnet/device ID of this

module. to modify the address, fill in the new address, and click the “Modify initial address ”Click the “+Add” button, the device will be added to “ON-line devices “list.

Method two:

1- Run HDL-bus pro tool
2- Search for the online devices by clicking on search button and the device will be displayed on “online device list”

4.1.2 Remark

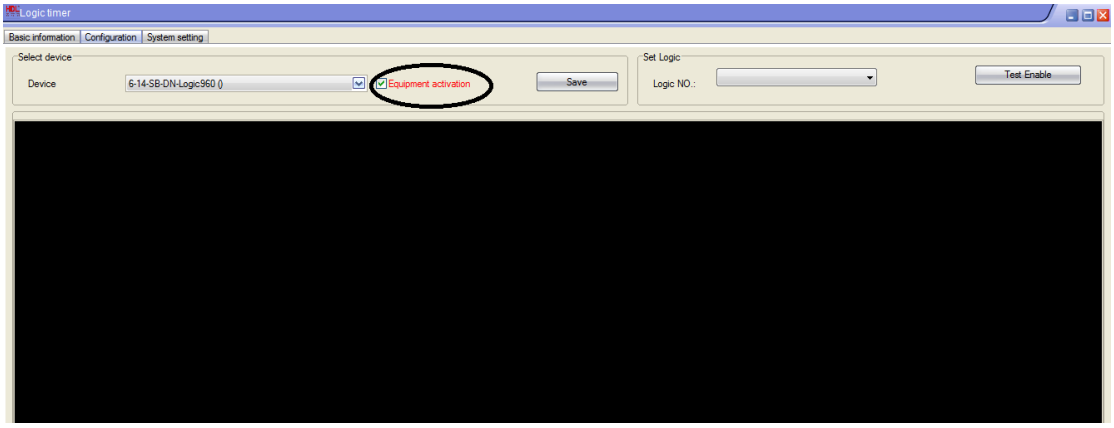
To give a name to the module, so you can recognize it from other modules.

4.2 Configurations

As mentioned above the logic module is used for automating other HDL modules.
And in this tab, we will see how to setup a logic table with input conditions.

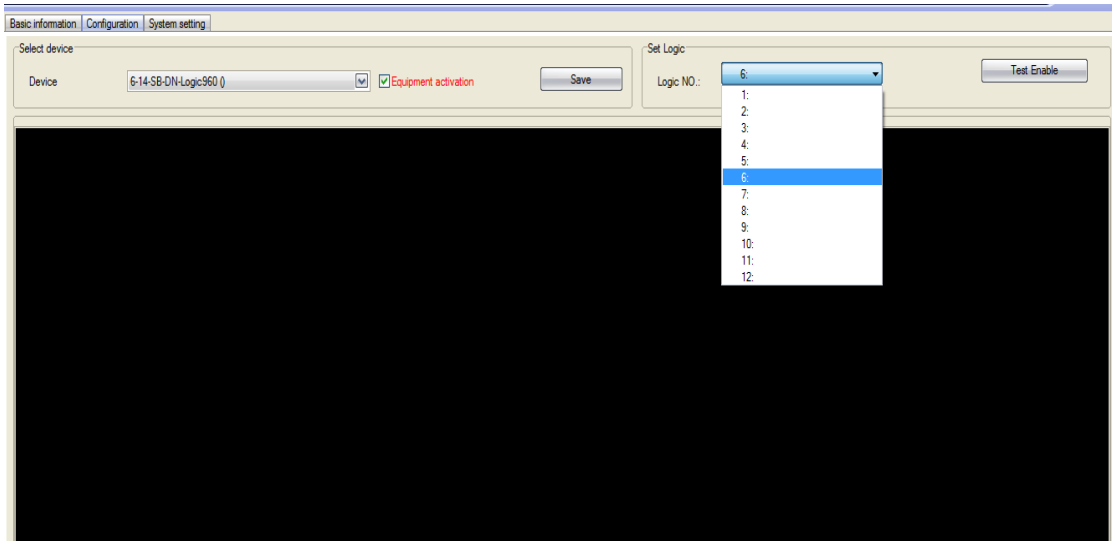
4.2.1 Equipment activation

If this option is unchecked, it means that the logic module has been disabled and will no longer perform any process.



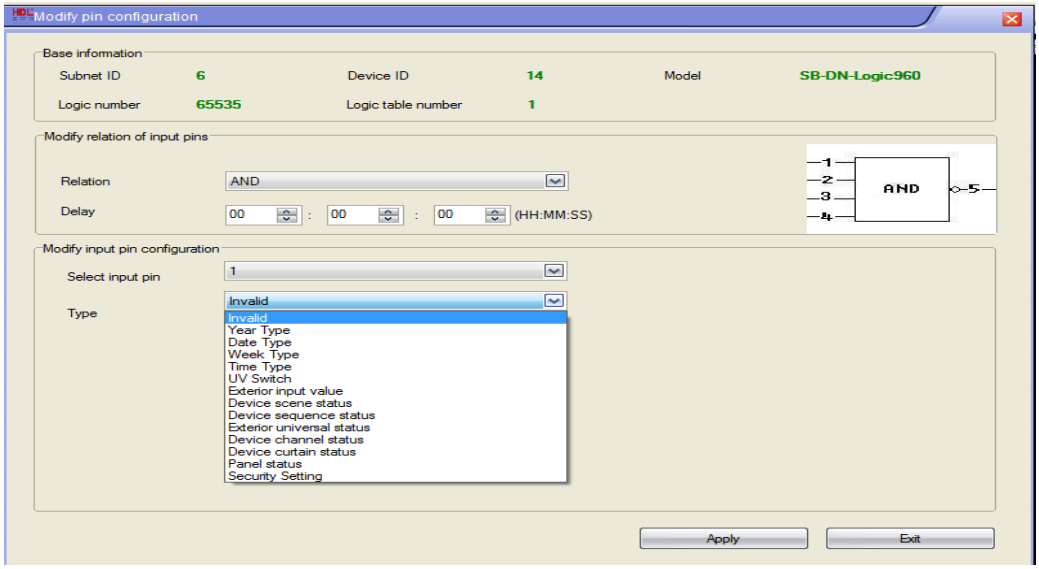
4.2.2 Input conditions

First select a logic table from the “logic No” list, double click on the blank black area to start configuration and then select a logic relation from (AND, OR, XOR, NAND) according to your requirements.



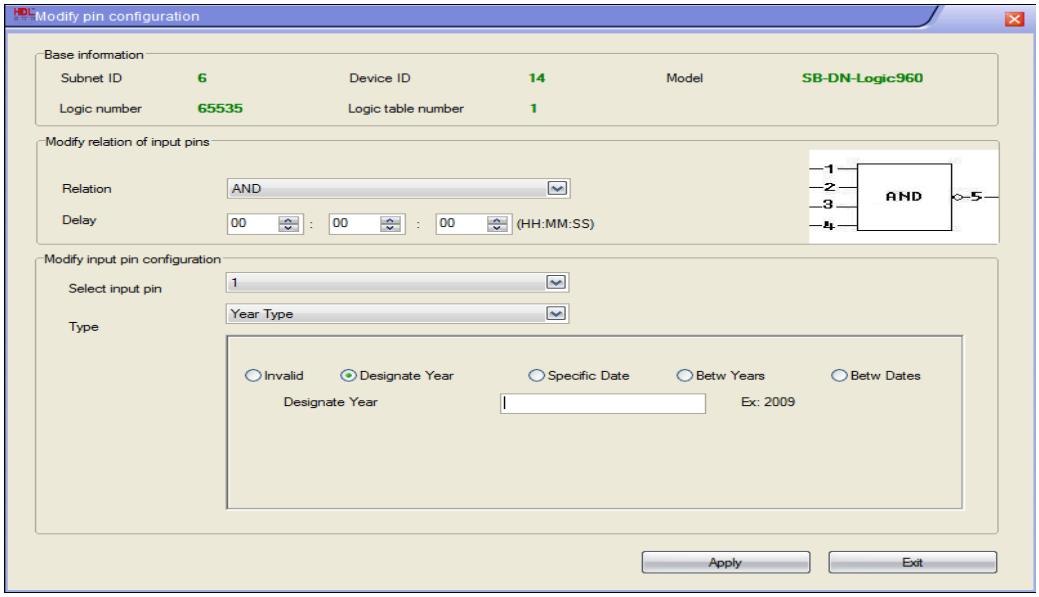
-As the logic module is a very flexible automation device, there are many input conditions that will be used to reach any possible logic, each logic table can have maximum of four input conditions.

Below are the explanations of each logic input:-

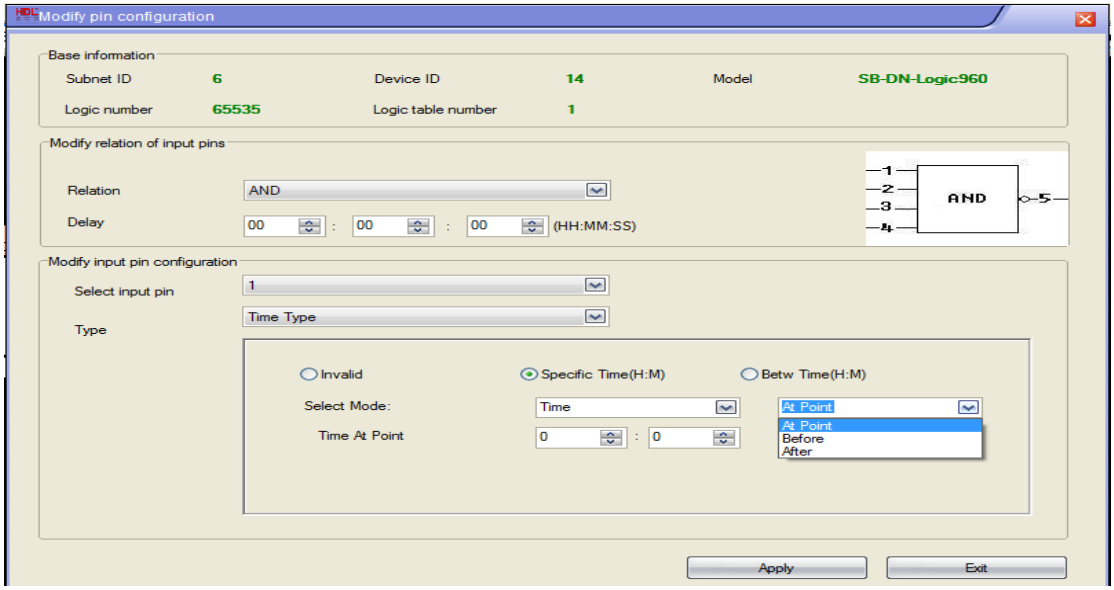


a) Year type:

This input is to select specific year, date or between years and dates.



b) Date type: You can specify date data with a numeric month.



Options:-

-At date point: select a designate or specific date for example: June 4th

-Date period: you can select interval of time (date), for example: from Oct 7th-Nov 30th

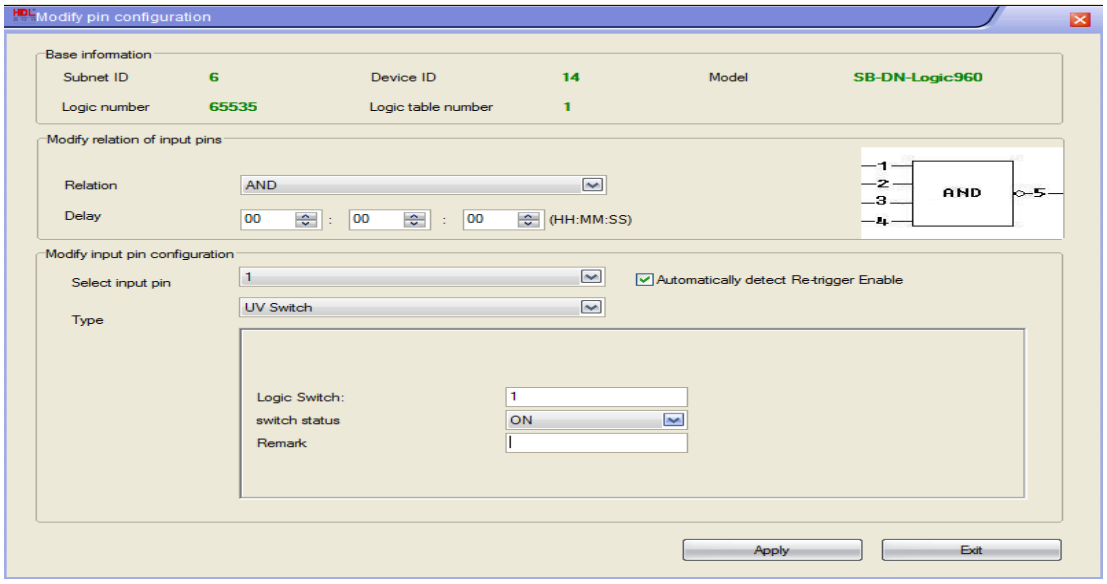
-Every month: this is the whole year settings.

c) Week type: you can select a specific week day or between weekdays (from specific day to another) e.g.: from Monday- Friday

d) Time type: this is used to set a particular day time or before and after specific time.

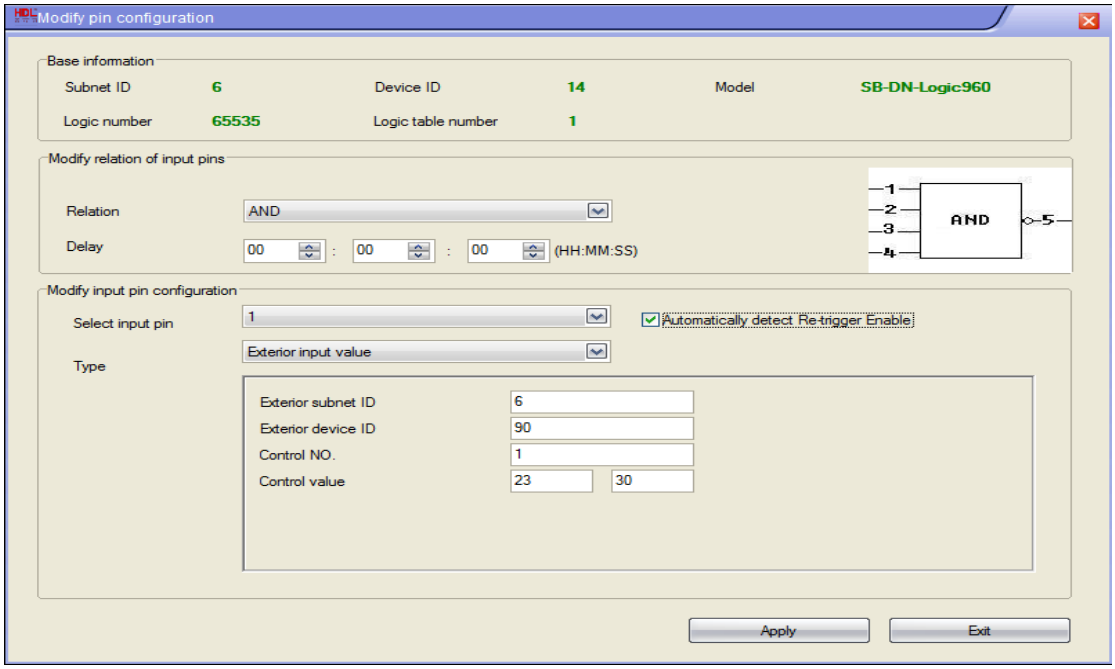
-specific time: select a particular time, you can also set the specific time as sunrise or sunset *(you need to set the time for sunrise and sunset on the system settings tab)*

e) Universal switch: is a general communication method for all modules, some devices can send out UV switch to logic module. So you can set a UV switch as your input condition.



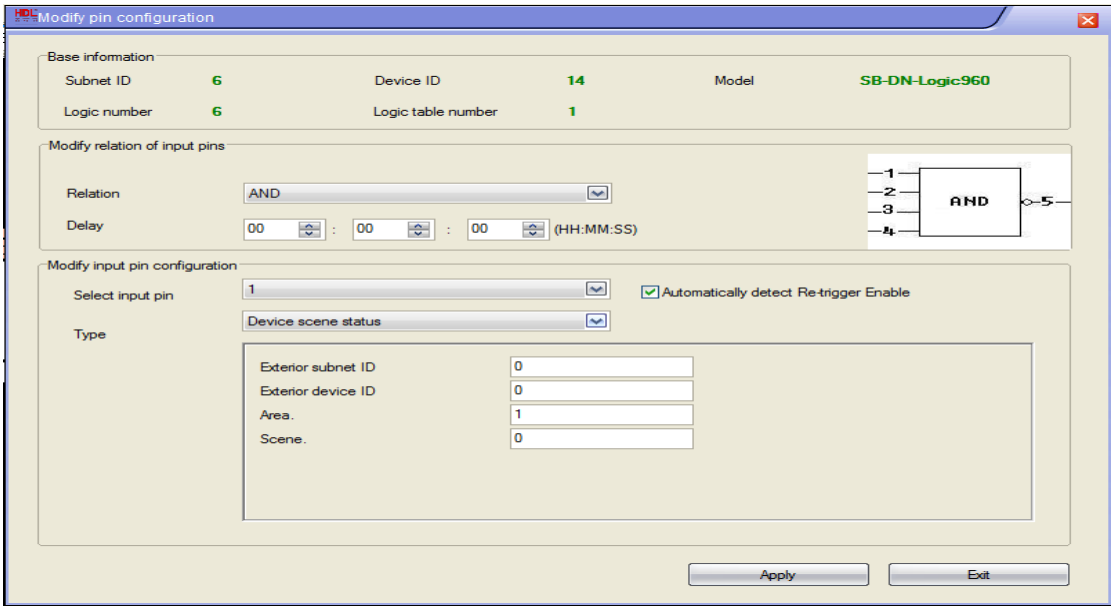
f) Exterior input value

This function is used to detect an output value. For now it's only used for temperature,

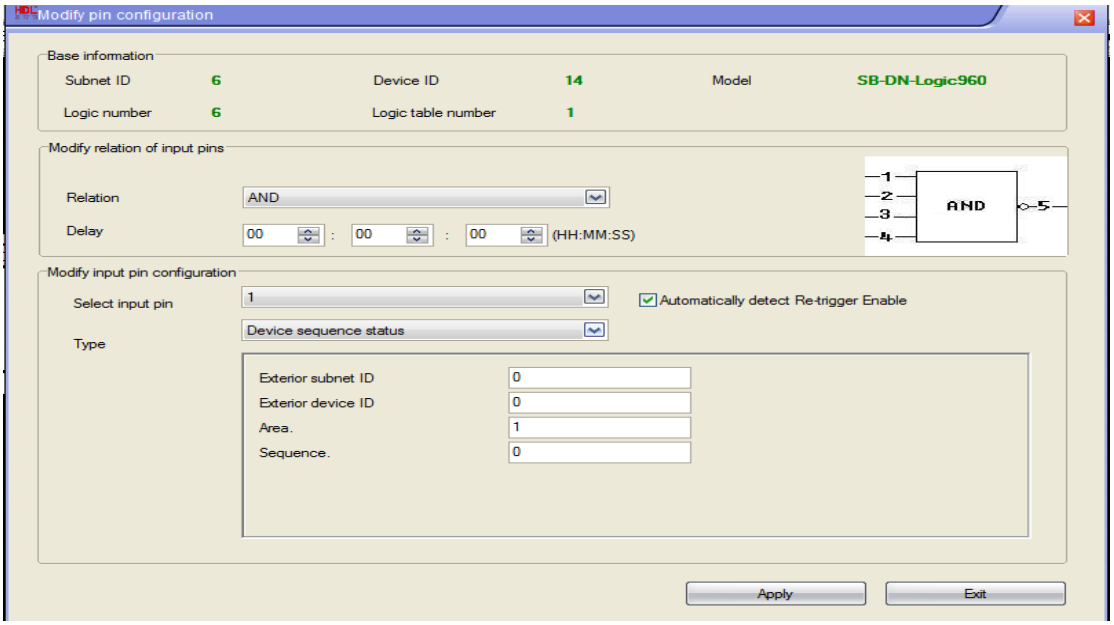


g) Device scene status: you can put a dimmer/relay scene status as a condition for your logic, so a target will be triggered when the scene is ON or OFF.

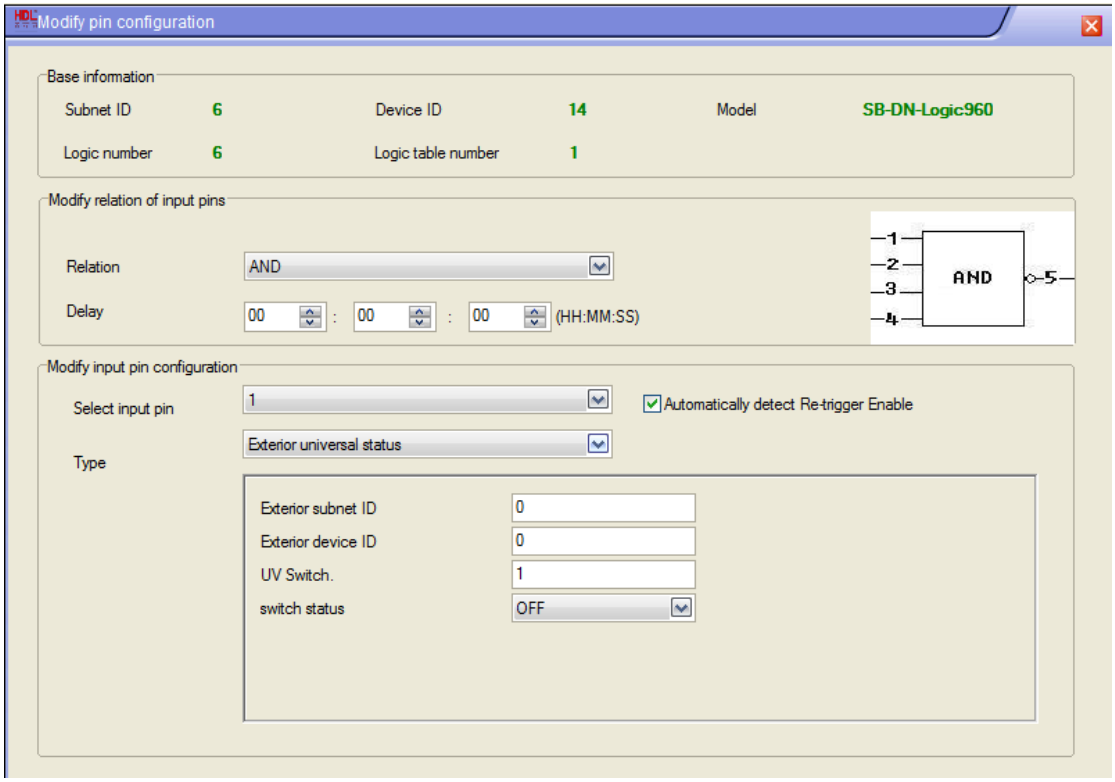
-Put the subnet/device ID of the target module, the area and scene number.



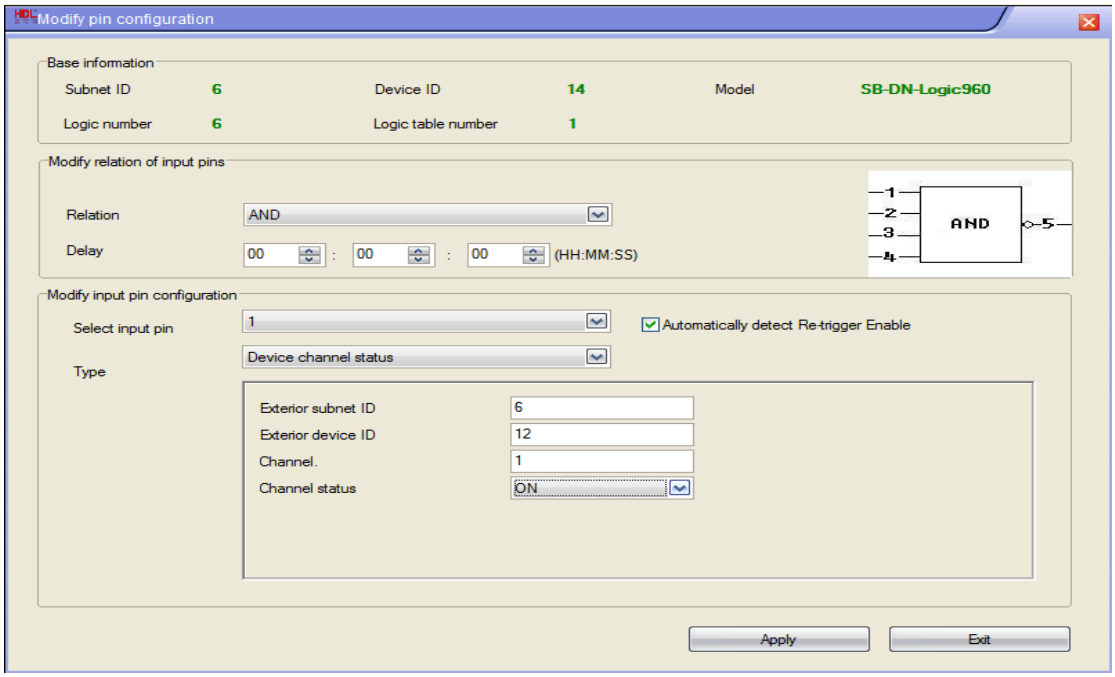
h) Device sequence status: you can put a dimmer/relay sequence status as a condition for your logic, so a target will be triggered when the sequence is ON or OFF.



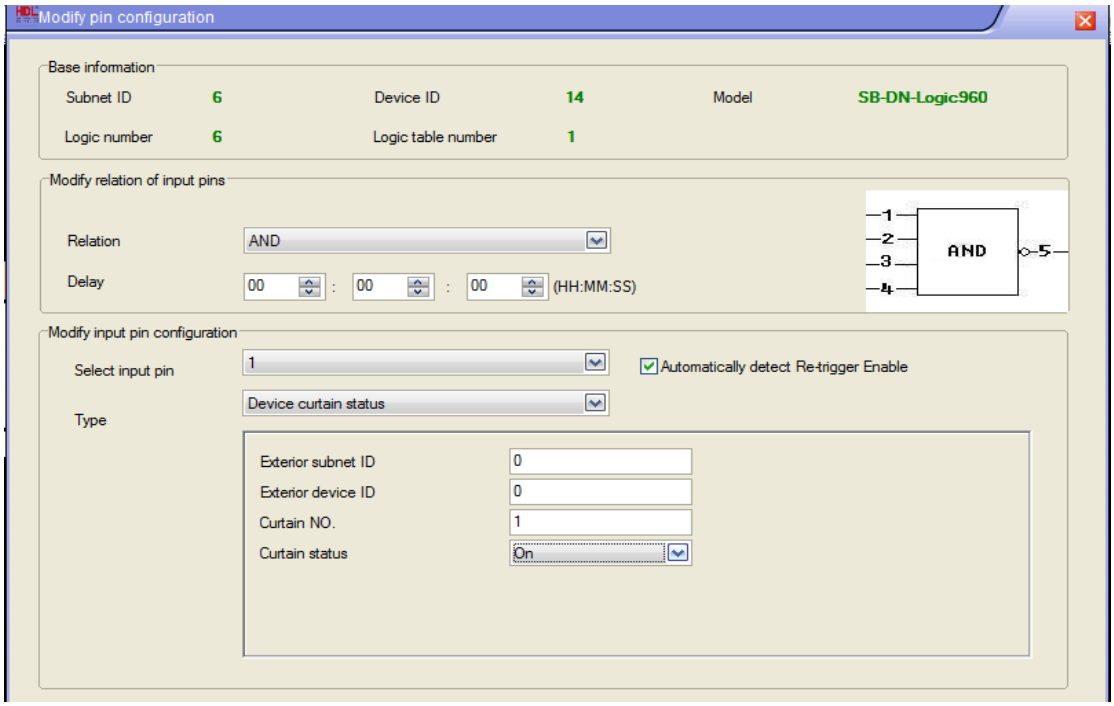
i) Exterior universal status: this feature is used to monitor the status of an external universal switch and send out command according to the UV switch status.



j) Device channel status: This is used to read dimmer/relay channel status, so when the channel is ON or OFF, the logic can send out a command to trigger a target.

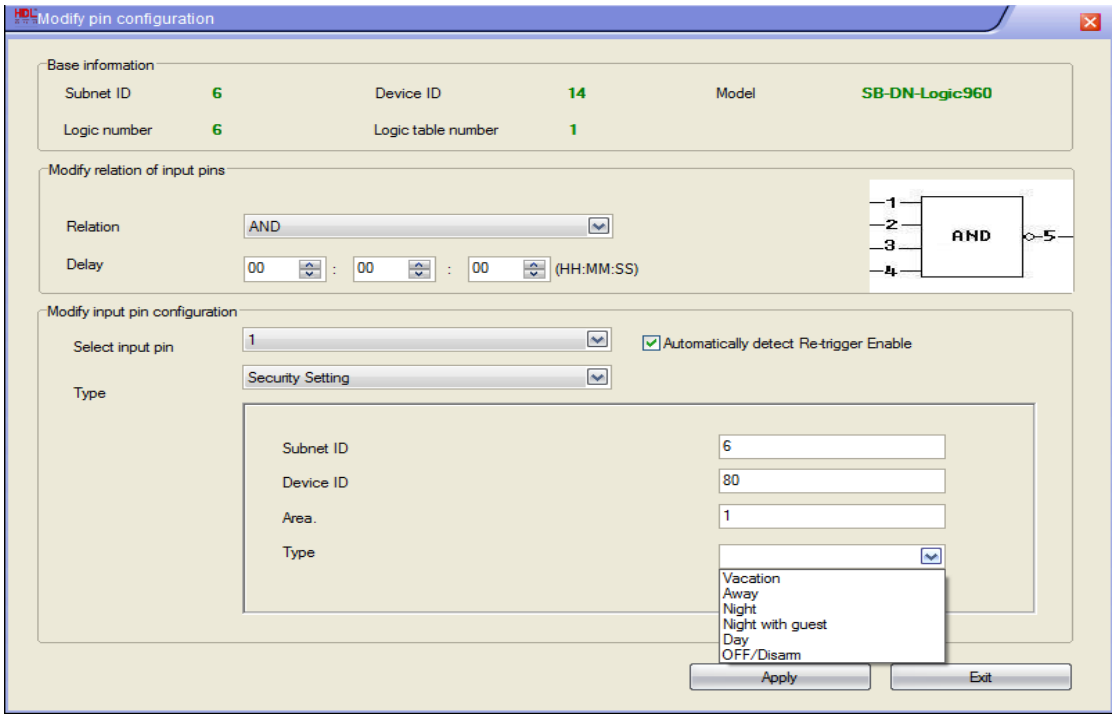


k) Device curtain status: you can put curtain status as a condition for your logic, so a target will be triggered when the curtain is ON or OFF.



l) Panel status: the logic module can read the status of the panel functions, including IR function, Lock key of panel, AC power, cooling temperature, fan speed, AC mode , Ac heating temperature and AC auto

m) Security settings: this is to read the status of the security module arming settings.



4.2.3 Additional settings

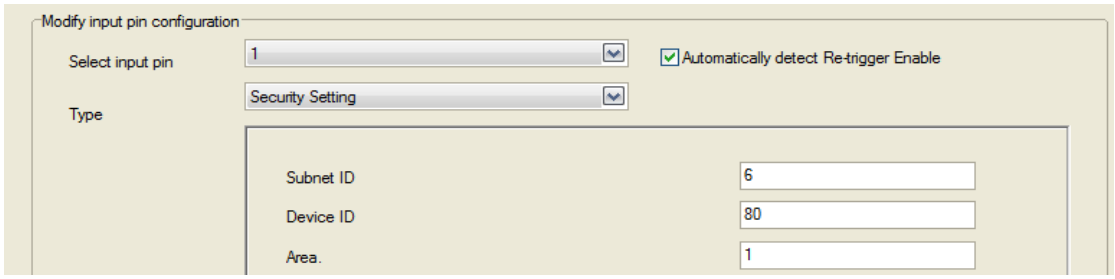
a) Delay time settings

When a trigger is applied, the logic module will postpone the output according to the delay time that you set on your logic table.

P.s: if you send many input commands to the logic module and there is a delay time, the logic will calculate the delay time and the action maybe delayed longer than the expected time.

b) Automatically detect re-trigger enable

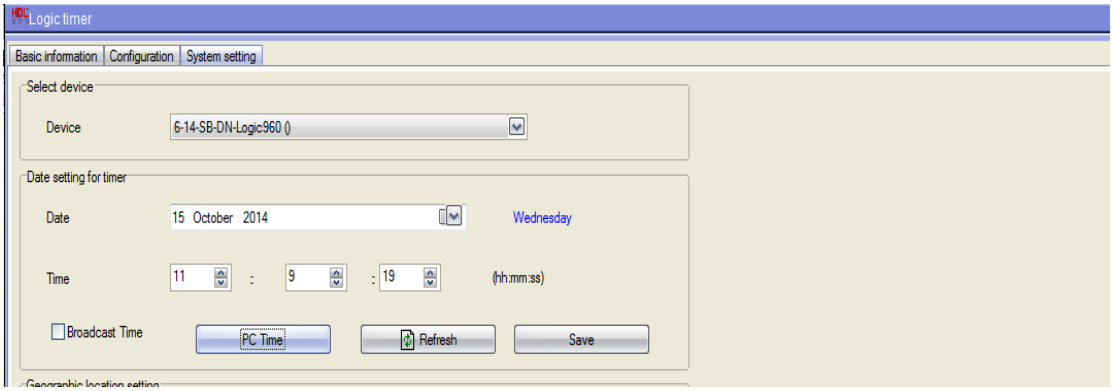
if this option selected means every time the logic module receives a command, it will re-trigger the target again, no matter the target is already triggered or not.



4.3 system setting

4.3.1 Date settings for timer

Before using the logic module and starting configuring it, you must set the current date and time. The current date and time settings are used as standard timer settings for functions that require date and time, you can set your PC's date and time by just clicking on "PC time "and "save"

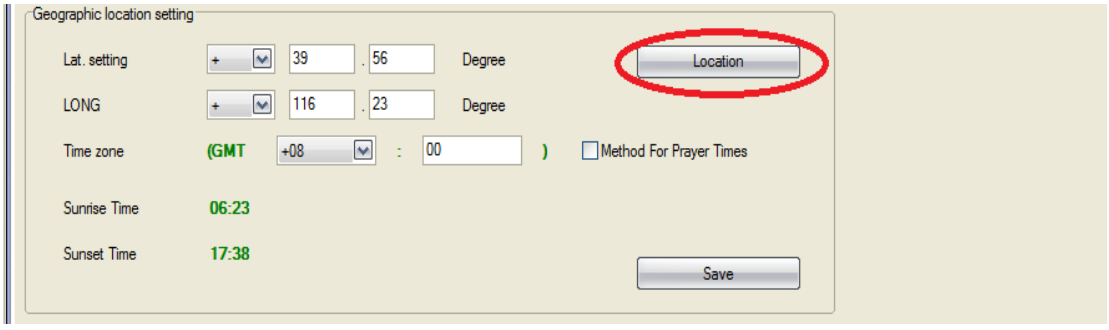


-you can also broadcast the time to HDL-bus so other devices can receive the time settings from the logic module , just tick on " Broadcast Time" option.

4.3.2 Geographic location settings

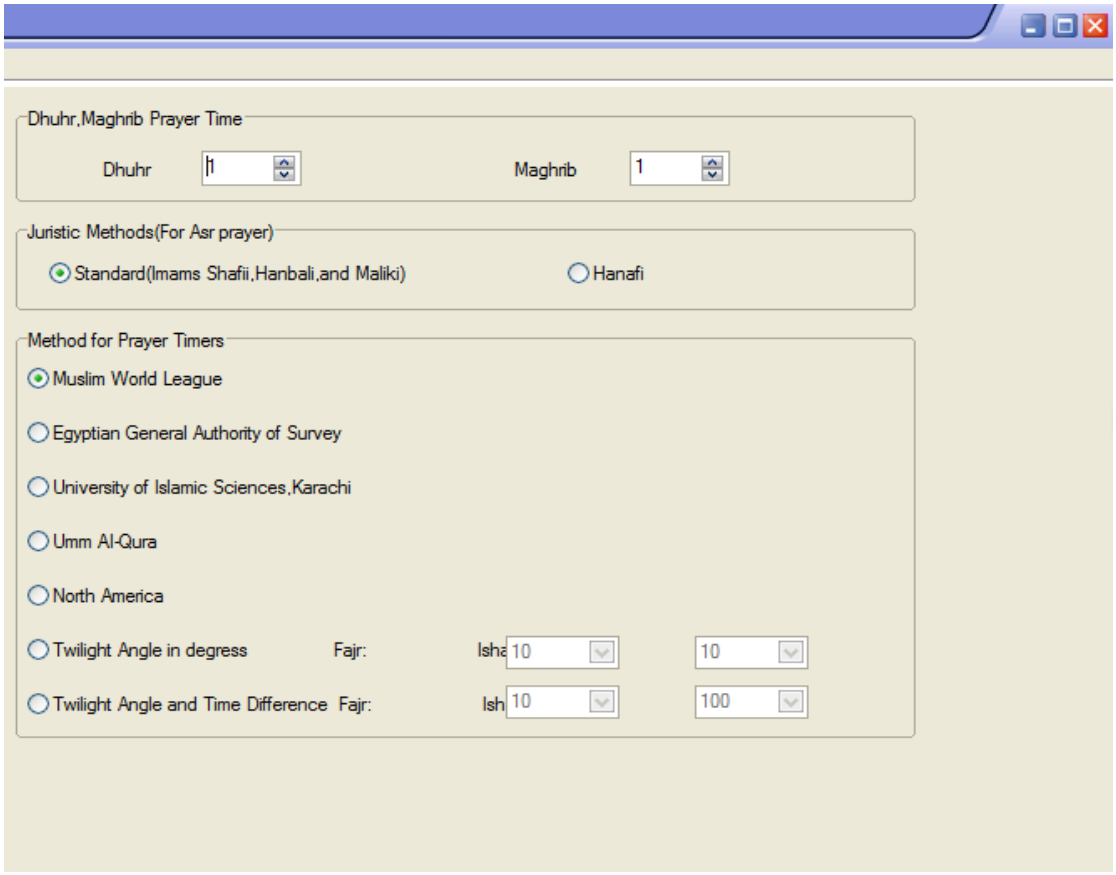
4.3.2.1 Geographic location

You can manage location settings in logic module through the system settings tab.
You can also set the particular point of your place on the surface by setting the latitude (LAT) and longitude (LONG) points, or you can just find your country and city in the system by clicking on "location"
P.s:- configuring the location settings help the system to calculate the sunrise and sunset time for that particular location



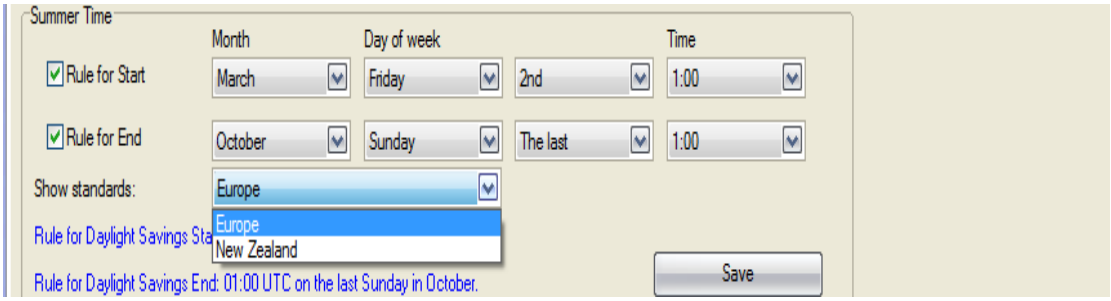
4.3.3 Method of prayer times

Different countries may have different Islamic methods; you can set the prayer times method according to your country here.



4.3.4 Summer time settings

As some countries use the summer time settings and The summer time implementation period and regions differ by country, thus you can set the summer time settings according to your region on logic module.



5 applications

Application 1 – Irrigation schedule

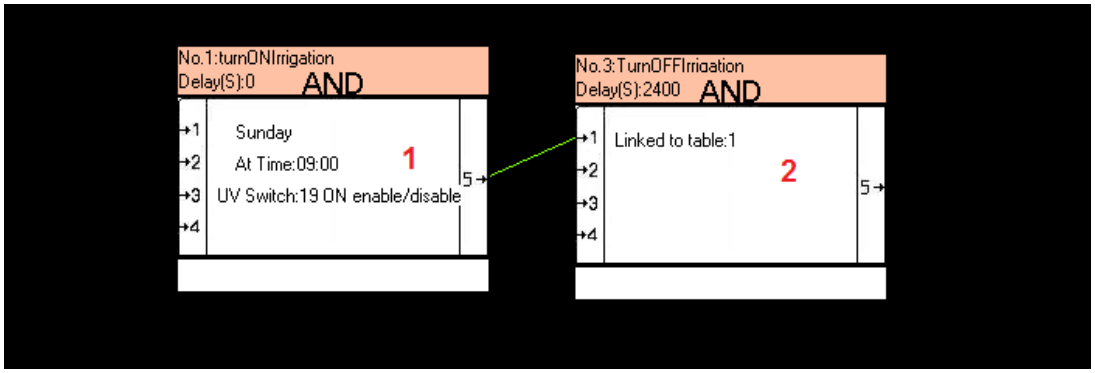
Requirement

Turn on the irrigation at 9 a.m. on every Sunday for 40 minutes; end-user has a button to enable/disable the schedule logic.

Note

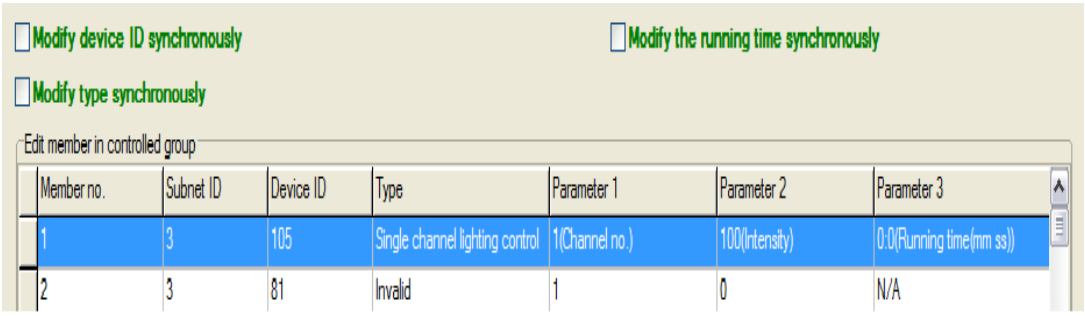
The water valve is controlled by a relay channel of a Relay module.

Configuration – Logic module



Logic (1):- it has three conditions 1-week type (Sunday), 2-time type (9am) and 3- UV (19) should be ON,

Target (output):- The target relay must set ON

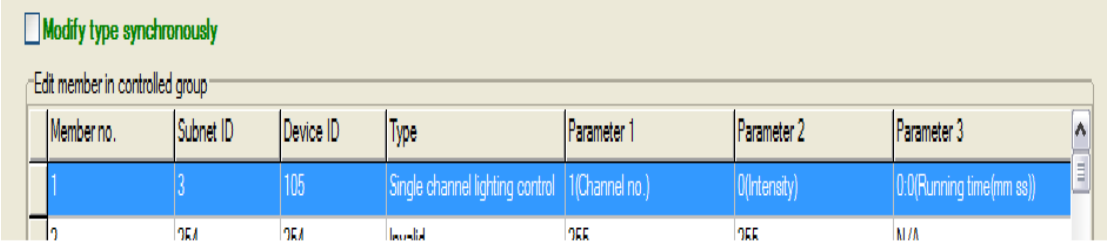

Modify device ID synchronously
Modify the running time synchronously
Modify type synchronously
Edit member in controlled group
Member no. | Subnet ID | Device ID | Type | Parameter 1 | Parameter 2 | Parameter 3
1 | 3 | 105 | Single channel lighting control | 1(Channel no.) | 100(Intensity) | 0:0(Running time(mm ss))
2 | 3 | 81 | Invalid | 1 | 0 | N/A

Logic (2):- its linked to logic (1), to do that:- a) Right click on logic(1) and select “ confirm start point”

b) and then right click on Logic(2) and select “confirm end point”

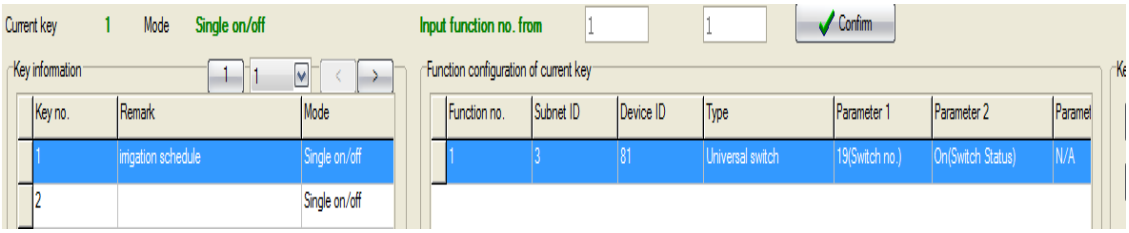
-set delay time for logic(2), 40minutes in this example, so after 40 minutes it will be OFF

Target (output):- set the relay this time as OFF



Configuration – Panel

Assign one key (button) to send the specified UV switch to the logic module, so you can enable/disable the schedule from user panel, the mode should be **Single ON/OFF..**



Application 2 – Birthday remainder

Requirements:-

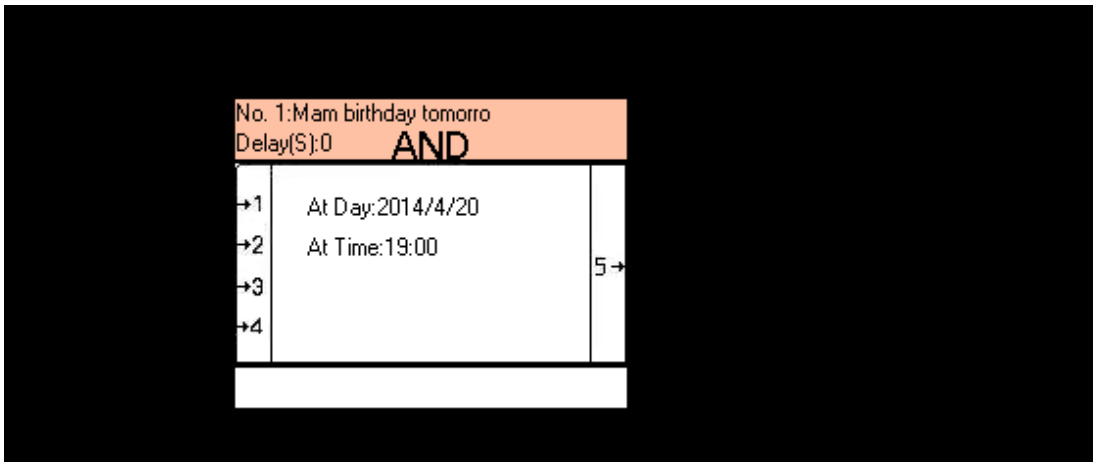
Remind the end-user the birthdays of his/her families and close friends in advance (so that end-user has the time to prepare the presents), via voice (SB-Z-Audio or HDL-MZBOX.20).

Note

The reminder voice files (.mp3 files) have been recorded and have been put in a folder named “special” in the SD card, they are “015 birthday-grandma.mp3”, “016 birthday-me.mp3”, “017 birthday-wife.mp3”, “018 birthday-kids”, etc. The specific Universal Switch number has specific meaning for SB-Z-Audio, 208 is to select SD, 150 is to select the folder “special”, and 15 is to select “015 birthday-grandma.mp3”, for more Universal Switch, please check “Z-Audio list.pdf”.

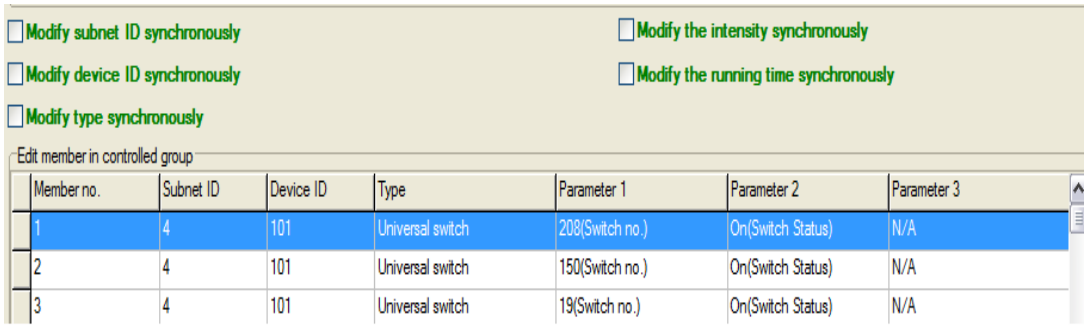
ftp://59.41.255.150/HDL-BUS/HDL-BUS%20Products/SB-Z-Audio/

Configuration – Logic module



Set the pin as “year type” and select “specific date” option

Target (output):-


Modify subnet ID synchronously
Modify device ID synchronously
Modify type synchronously
Modify the intensity synchronously
Modify the running time synchronously
Edit member in controlled group
Member no. | Subnet ID | Device ID | Type | Parameter 1 | Parameter 2 | Parameter 3
1 | 4 | 101 | Universal switch | 208(Switch no.) | On(Switch Status) | N/A
2 | 4 | 101 | Universal switch | 150(Switch no.) | On(Switch Status) | N/A
3 | 4 | 101 | Universal switch | 19(Switch no.) | On(Switch Status) | N/A

Application 3 – Timer for cooking

Requirement

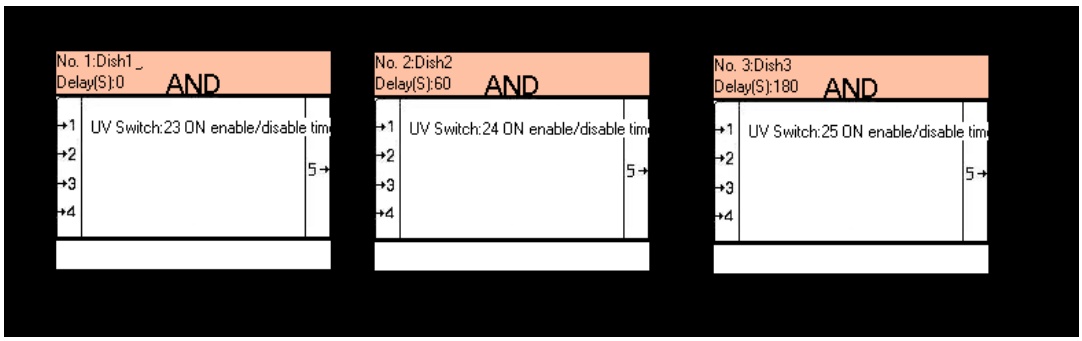
Set up several timers – 1 minute, 3 minutes, 5 minutes, 10 minutes and 30 minutes, when end-user press the button in the kitchen, a corresponding timer is started, the 30 second down-count voice will start to play when the time is elapsing.

Note

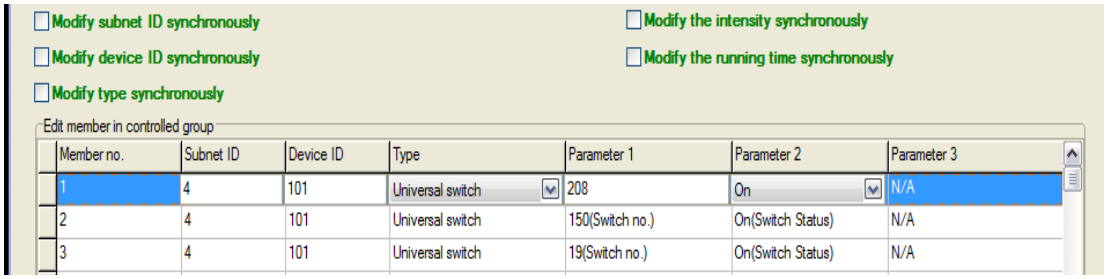
The is voice files “019 timer-1m.mp3”, “020 timer-3m.mp3”, “021 timer-5m.mp3”, “022 timer-10m.mp3”, “023 timer-30m.mp3” have been put in the folder named “special” in the SD card. The specific Universal Switch number has specific meaning for SB-Z-Audio, 208 is to select SD, 150 is to select the folder “special”, and 19 is to select “019 timer-1m.mp3”, for more Universal Switch, please check “Z-Audio list.pdf”.

ftp://59.41.255.150/HDL-BUS/HDL-BUS%20Products/SB-Z-Audio/

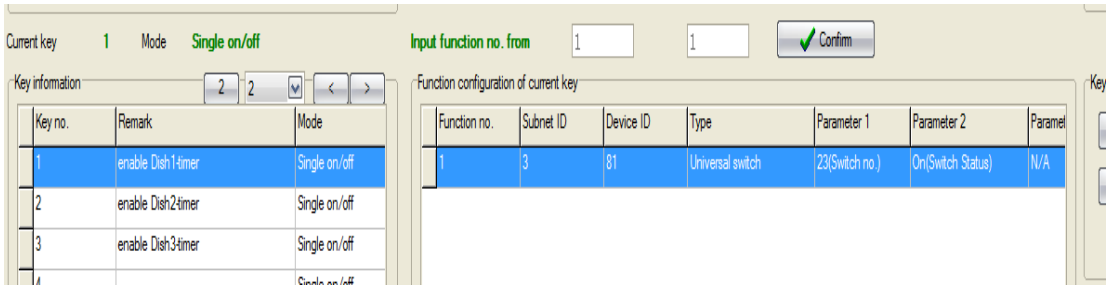
Configuration – Logic module



Target (output)


Modify subnet ID synchronously
Modify the intensity synchronously
Modify device ID synchronously
Modify the running time synchronously
Modify type synchronously
Edit member in controlled group
Member no. | Subnet ID | Device ID | Type | Parameter 1 | Parameter 2 | Parameter 3
1 | 4 | 101 | Universal switch | 208 | On | N/A
2 | 4 | 101 | Universal switch | 150(Switch no.) | On(Switch Status) | N/A
3 | 4 | 101 | Universal switch | 19(Switch no.) | On(Switch Status) | N/A

Configuration – Panel


Current key 1 Mode Single on/off
Input function no. from 1 1
Confirm
Key information
Key no. | Remark | Mode
1 | enable Dish1-timer | Single on/off
2 | enable Dish2-timer | Single on/off
3 | enable Dish3-timer | Single on/off
Function configuration of current key
Function no. | Subnet ID | Device ID | Type | Parameter 1 | Parameter 2
1 | 3 | 81 | Universal switch | 23(Switch no.) | On(Switch Status) | N/A

Application 4 - Wake up scene

Requirement

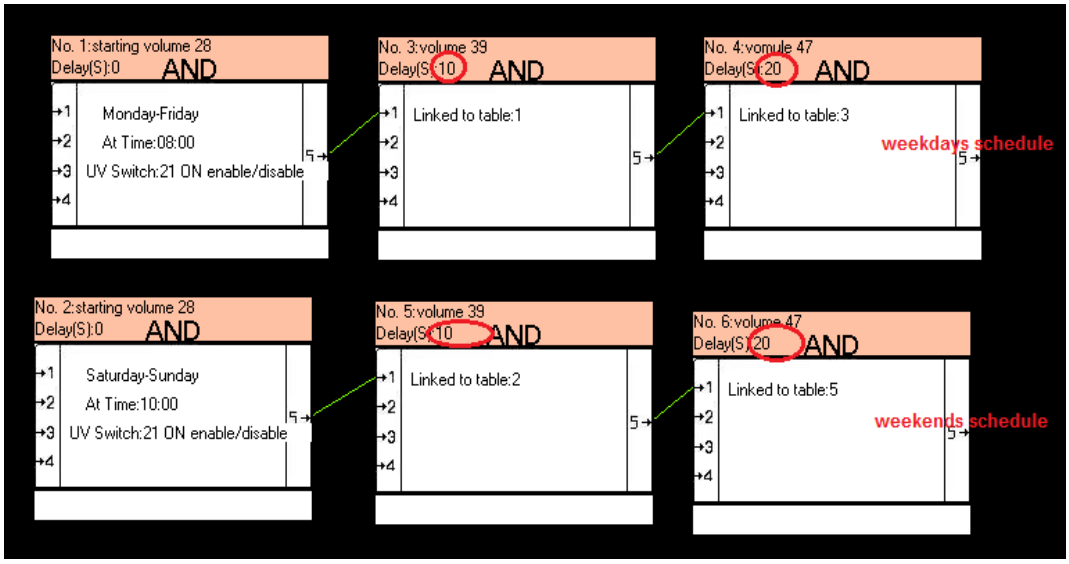
Every morning at 8 a.m. on every weekday (Monday to Friday) and 10 a.m. on weekend (Saturday and Sunday), wake end-user up by opening the curtain, playing a specific song, turn up the volume slowly though (every 10 seconds, step up the volume). End-user has a button to enable/disable the scene at previous night and another button to stop the music.

Note:-

The song “025 wakeup.mp3” has been put in the folder named “special” in the SD card. The specific Universal Switch number has specific meaning for SB-Z-Audio, 208 is to select SD, 150 is to select the folder “special”, and 25 is to select “025 wakeup.mp3”, 215 to 224 is for volume control, minimum to maximum, respectively. For more Universal Switch, please check “Z-Audio list.pdf”.

ftp://59.41.255.150/HDL-BUS/HDL-BUS%20Products/SB-Z-Audio/

Configuration – Logic module

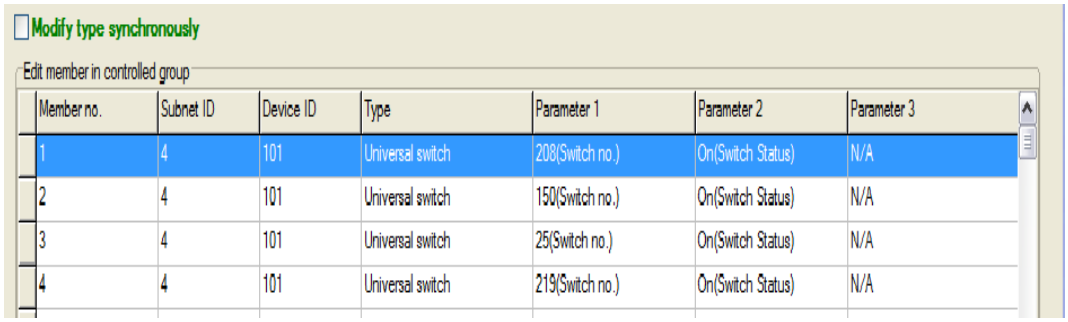


Three conditions for each table scene:-

a) Week type (between weekdays) b) time type (specific time) c) UV switch

-connect the other tables to the first table and set them a delay to increase the volume of the played song slowly

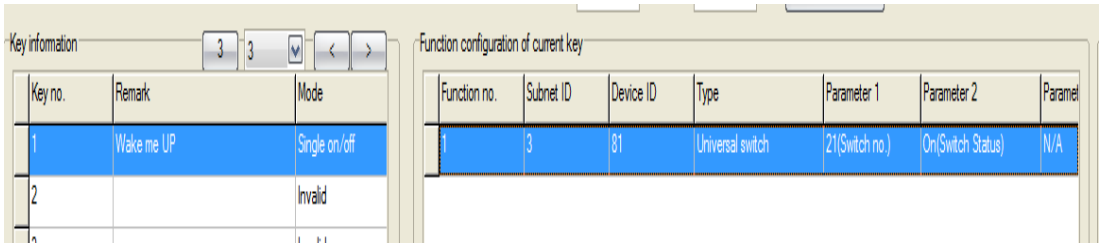
Targets (output):-


Modify type synchronously
Edit member in controlled group
Member no. | Subnet ID | Device ID | Type | Parameter 1 | Parameter 2 | Parameter 3
1 | 4 | 101 | Universal switch | 208(Switch no.) | On(Switch Status) | N/A
2 | 4 | 101 | Universal switch | 150(Switch no.) | On(Switch Status) | N/A
3 | 4 | 101 | Universal switch | 25(Switch no.) | On(Switch Status) | N/A
4 | 4 | 101 | Universal switch | 219(Switch no.) | On(Switch Status) | N/A

This is for the first table means the starting volume will be “voice28” UV-219,

Configuration – Panel

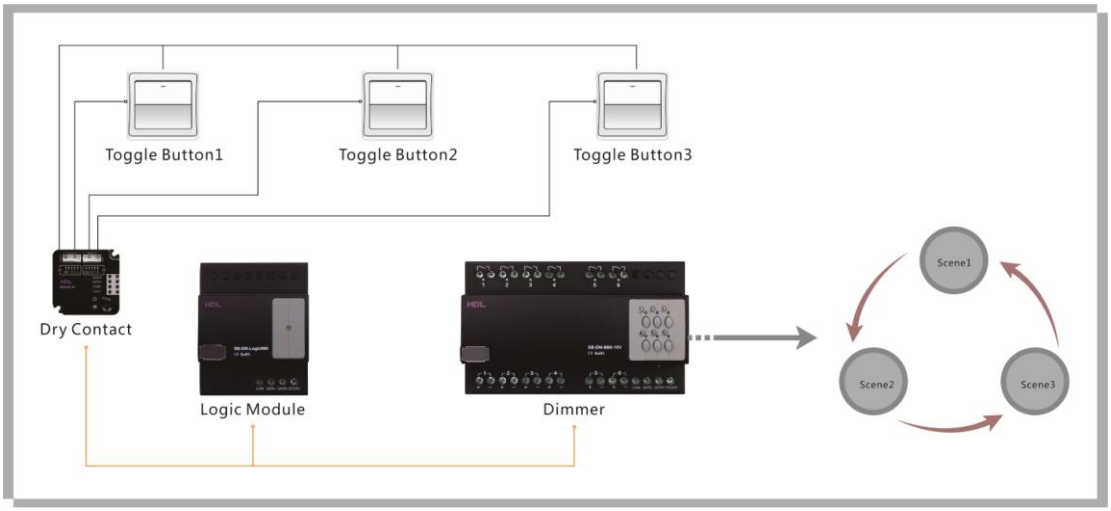
On the panel all we need is to send UV switch command to the logic module to enable/disable the scene from the panel…


Key information
Key no. | Remark | Mode
1 | Wake me UP | Single on/off
2 | | Invalid
Function configuration of current key
Function no. | Subnet ID | Device ID | Type | Parameter 1 | Parameter 2
1 | 3 | 81 | Universal switch | 21(Switch no.) | On(Switch Status) | N/A

Application 5 – Trigger the next scene when one of any toggle switch is toggled.

Requirement

Use the existing toggle buttons to trigger the scenes in a dimmer in this way **–** When the toggle switch is pressed, no matter the status of the toggle switch is **ON or OFF** as long as there is an action, the scene should be changed to next one, (a circle): scence1->Switch toggled -> scene2 -> Switch toggled -> scene3 -> Switch toggled -> scene1…

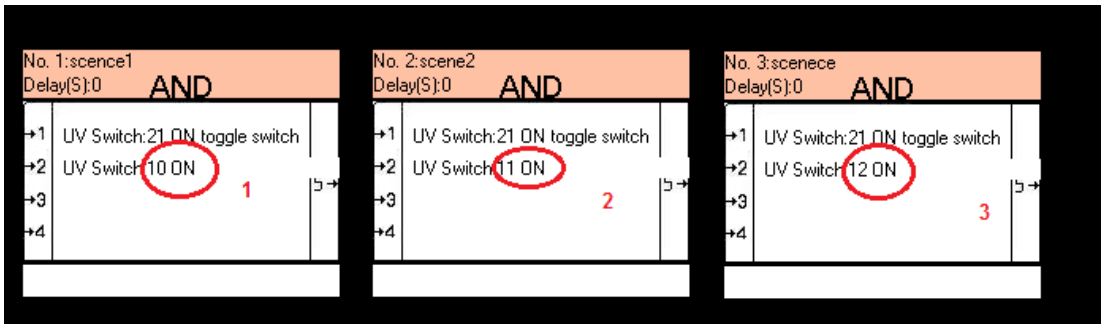


Acknowledge

A Hongkong customer raised this typical application, HDL RnD Dept. manager Dicky provided the simple solution.

Configuration - Logic module

Setup some logic tables with some outputs, each logic should have two pins(two conditions) and both of them should be UV switch



N.B:- The “Automatically detect re-trigger enable” option should be ticked (selected) in each logic table

Targets (output)

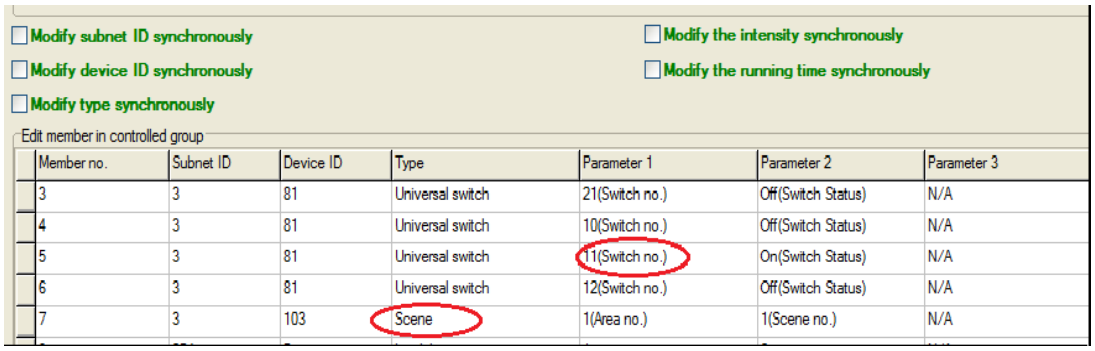
Each logic table will send out the fallowing:-

a) OFF command to UV-switch (21) {common UV switch for all the three tables}…

b) ON command to the next table (UV switch) and off to the other 2 tables

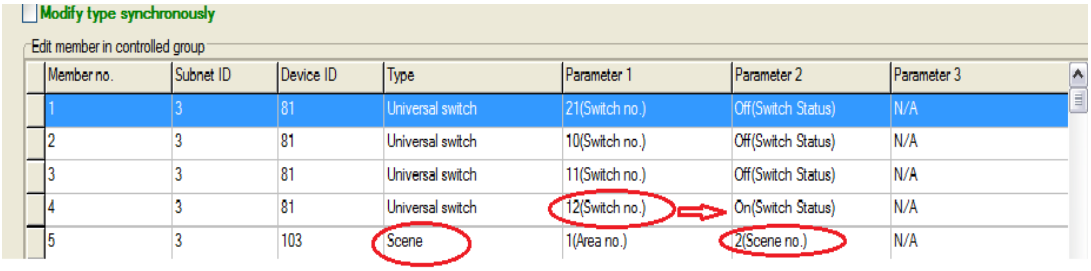
c) Also turn ON a specific scene…

E.g:- table **(1)** output should be like this….


Modify subnet ID synchronously
Modify device ID synchronously
Modify type synchronously
Modify the intensity synchronously
Modify the running time synchronously
Edit member in controlled group

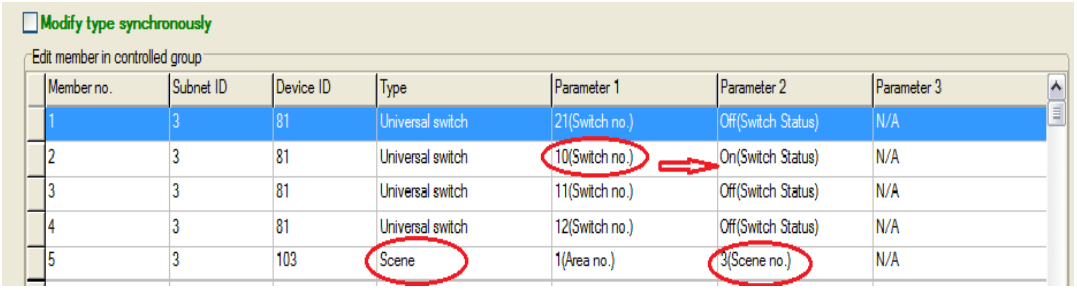
Member no.	Subnet ID	Device ID	Type	Parameter 1	Parameter 2	Parameter 3
3	3	81	Universal switch	21(Switch no.)	Off(Switch Status)	N/A
4	3	81	Universal switch	10(Switch no.)	Off(Switch Status)	N/A
5	3	81	Universal switch	11(Switch no.)	On(Switch Status)	N/A
6	3	81	Universal switch	12(Switch no.)	Off(Switch Status)	N/A
7	3	103	Scene	1(Area no.)	1(Scene no.)	N/A

Table **(2)** output..



Member no.	Subnet ID	Device ID	Type	Parameter 1	Parameter 2	Parameter 3
1	3	81	Universal switch	21(Switch no.)	Off(Switch Status)	N/A
2	3	81	Universal switch	10(Switch no.)	Off(Switch Status)	N/A
3	3	81	Universal switch	11(Switch no.)	Off(Switch Status)	N/A
4	3	81	Universal switch	12(Switch no.)	On(Switch Status)	N/A
5	3	103	Scene	1(Area no.)	2(Scene no.)	N/A

Table **(3)** output



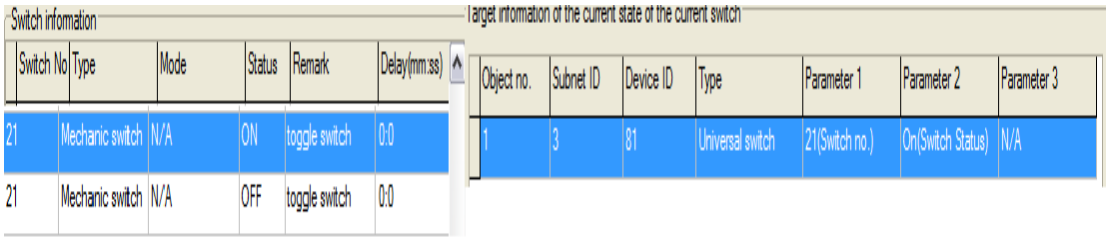
Member no.	Subnet ID	Device ID	Type	Parameter 1	Parameter 2	Parameter 3
1	3	81	Universal switch	21(Switch no.)	Off(Switch Status)	N/A
2	3	81	Universal switch	10(Switch no.)	On(Switch Status)	N/A
3	3	81	Universal switch	11(Switch no.)	Off(Switch Status)	N/A
4	3	81	Universal switch	12(Switch no.)	Off(Switch Status)	N/A
5	3	103	Scene	1(Area no.)	3(Scene no.)	N/A

Configuration - Dry contact

On the dry contact first we need to assign three switches (channels) to send commands to the logic module by sending UV switch , for example in this solution we send UV(21) which means the dry contact send commands to all the three tables because all of them share UV(21)…

N.B:- The switch type should be **Mechanical switch ,** so there will be two mechanical switch for each switch (mechanical switch ON and mechanical switch

OFF) and both output UV switch status should be ON



5. NOTES

Since 1985